CLAIMS

1. (Currently Amended) An iodine injection system for a laser, comprising: a symmetric two-dimensional [[m]]Minimum [[1]]Length [[n]]Nozzle (MLN) having:

a curved sonic line[[,]];

a throat[[,]]; and

an exit plane[[,]]; and

wherein the nozzle feeds a laser cavity; and

at least one iodine injection strut that is located downstream of the throat.

- 2. (Original) The iodine injection system according to claim 1 wherein a stream comprising oxygen flows through the nozzle and an upstream edge of the strut is perpendicular to the velocity of the stream.
- 3. (Original) The iodine injection system according to claim 2 wherein the upstream edge of the strut is a sharp wedge with an angle less than 45°.
- 4. (Original) The iodine injection system according to claim 3 wherein the sharp wedge has an angle of 20° or less.
- 5. (Original) The iodine injection system according to claim 1 wherein the strut has a coating on its outer surface.
- 6. (Original) The iodine injection system according to claim 1 wherein the nozzle has a kernel region and the strut is located near the downstream end of the kernel region.
- 7. (Original) The iodine injection system of claim 6 wherein the downstream edge of the kernel region is located between 10% to 50% of the distance from the throat and the exit plane.
- 8. (Original) The iodine injection system according to claim 1 wherein the strut is located in the region that is between the nozzle throat and exit plane.

- 9. (Previously Presented) The iodine injection system of claim 1 wherein the strut is located within 20% to 90% of the distance between the nozzle throat and the exit plane.
- 10. (Original) The iodine injection system according to claim 1 wherein the strut comprises an iodine feed duct and at least one orifice through which the iodine exits the feed duct.
- 11. (Original) The iodine injection system according to claim 10 wherein the feed duct has two ends and is manifolded for iodine feed from both ends.
- 12. (Original) The iodine injection system according to claim 10 wherein the at least one orifice is circular.
- 13. (Original) The iodine injection system according to claim 10 wherein the at least one orifice is oval.
- 14. (Previously Presented) The iodine injection system according to claim 11 wherein the feed duct includes a carrier gas.
- 15. (Original) The iodine injection system according to claim 1 wherein the nozzle has walls and the height of the strut between the nozzle walls is about 2 cm to about 50 cm.
- 16. (Original) The iodine injection system according to claim 1 wherein the width of a strut is about 2 mm to about 10 mm.
- 17. (Original) The iodine injection system according to claim 16 wherein the diameter of an injected iodine plume is equal to or less than the width of the strut.
- 18. (Original) The iodine injection system according to claim 1 wherein there are at least two struts that are sufficiently spaced apart to reduce the amount of bow shock from one strut from

impinging on an adjacent strut.

- 19. (Original) The iodine injection system according to claim 18 where the struts spaced apart by about 0.5 cm to 4 cm.
- 20. (Original) The iodine injection system according to claim 1 wherein the strut has at least one fin on its downstream face.
- 21. (Original) The iodine injection system according to claim 2 wherein the upstream edge of the strut is a sharp ogive.
- 22. (Original) The iodine injection system according to claim 3 wherein the sharp ogive has an angle of 20° or less.
- 23. (Currently Amended) The iodine injection system according to claim 1 wherein a carrier gas is injected with <u>the</u> iodine.
- 24. (Original) The iodine injection system according to claim 23 wherein the carrier gas is helium.
- 25. (Original) The iodine injection system according to claim 23 wherein the carrier gas is nitrogen.
- 26. (Original) The iodine injection system according to claim 1 wherein there are at least two struts, the second strut being located further downstream in the nozzle than the first.
- 27. (Original) The iodine injection system according to claim 1 wherein there are at least two struts that are staggered between the nozzle throat and the exit plane.

- 28. (Original) The iodine injection system according to claim 1 wherein the strut further comprises a heating element.
 - 29. (Withdrawn) An iodine injection strut comprising:
 an upstream edge that is a sharp wedge less than 45°;
 an iodine feed duct manifolded for iodine feed from a top and a bottom end of the strut;
 at least one orifice for injecting iodine; and
 a heating element.
- 30. (Withdrawn) The iodine injection strut according to claim 29 wherein the sharp wedge has an angle of 20° or less.
- 31. (Withdrawn) The iodine injection strut according to claim 29 further comprising a coating on the exterior surface of the strut.
- 32. (Withdrawn) The iodine injection strut according to claim 31 wherein the coating is Teflon.
- 33. (Withdrawn) The iodine injection strut according to claim 31 wherein the coating is a plastic material.
- 34. (Withdrawn) The iodine injection strut according to claim 29 wherein the strut is located in a nozzle for a COIL and the nozzle has a throat and an exit plane.
- 35. (Withdrawn) The iodine injection strut according to claim 34 wherein the strut is located near the nozzle throat.
- 36. (Withdrawn) The iodine injection strut according to claim 34 wherein the strut is located between 10% to 50% of the distance between the throat and exit plane.

- 37. (Withdrawn) The iodine injection system according to claim 29 wherein the at least one orifice is circular.
- 38. (Withdrawn) The iodine injection strut according to claim 10 wherein at least one orifice is oval.
- 39. (Withdrawn) The iodine injection strut according to claim 29 wherein the strut has at least one fin on its downstream face.
- 40. (Withdrawn) The iodine injection system according to claim 34 wherein the nozzle is a symmetric two dimensional minimum length nozzle with a curved sonic line.
- 41. (Withdrawn) A nozzle for a COIL comprising a symmetric two dimensional minimum length nozzle with a curved sonic line.
- 42. (Withdrawn) The minimum length nozzle according to claim 41 further comprising a short converging nozzle section.
- 43. (Withdrawn) The minimum length nozzle according to claim 41 further comprising a throat, a wall, and an exit plane.
- 44. (Withdrawn) The minimum length nozzle according to claim 43 further comprising a gas injection strut located between the nozzle throat and exit plane.
- 45. (Withdrawn) The minimum length nozzle according to claim 44 wherein the upstream edge of the strut is a sharp wedge.
- 46. (Withdrawn) The minimum length nozzle according to claim 45 wherein the sharp wedge has an angle of 20° or less.

- 47. (Withdrawn) The minimum length nozzle according to claim 44 wherein the strut is coated with Teflon.
- 48. (Withdrawn) The minimum length nozzle according to claim 44 wherein iodine is injected through the gas injection strut.
- 49. (Withdrawn) The minimum length nozzle according to claim 48 wherein a carrier gas and iodine are injected through the gas injection strut.
- 50. (Withdrawn) The minimum length nozzle according to claim 43 further comprising a transition area between the throat and the wall.
- 51. (Withdrawn) The minimum length nozzle according to claim 50 wherein the transition area has an angle of about $10^{\circ} 25^{\circ}$ upstream of the throat.
- 52. (Withdrawn) The minimum length nozzle according to claim 41 wherein there is a thin fluid boundary layer along the wall.
- 53. (Withdrawn) The minimum length nozzle according to claim 52 wherein the Reynolds number at the throat is 10^4 to 10^6 .
- 54. (Withdrawn) The minimum length nozzle according to claim 41 wherein the width of the nozzle does not need to increase when the pressure in the COIL laser cavity decreases.
- 55. (Withdrawn) A system for delivering singlet oxygen and iodine to a COIL laser cavity comprising:

a singlet oxygen generator;

a symmetric two dimensional minimum length nozzle with a curved sonic line; and at least one iodine injection strut.

56. (Withdrawn) The system according to claim 55 wherein the singlet oxygen generator is part of a plenum for the nozzle and wherein the at least one iodine injection strut is located downstream of a throat for the nozzle.